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PATENT APPLICATION

ATTORNEY DOCKET NO. 10992120-4

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Beck et al.

Confirmation No.: 4419

Application No.: 10/705,301

Examiner: L. Nguyen

Filing Date: November 10, 2003

Group Art Unit: 2853

Title: Integrated Control of Power Delivery For Firing Resistors For Printhead Assembly (As Amended)

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on 11/15/05.

The fee for filing this Appeal Brief is (37 CFR 1.17(c)) \$500.00.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d)) for the total number of months checked below:

☐ 1st Month
\$120

☐ 2nd Month
\$450

☐ 3rd Month
\$1020

☐ 4th Month
\$1590

☐ The extension fee has already been filed in this application.

☒ (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.

Please charge to Deposit Account 08-2025 the sum of \$ 500 . At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees. A duplicate copy of this sheet is enclosed.

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Respectfully submitted,

Beck et al.

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COMMENTS:

RE: Appl. No. 10/705,301; Attorney Docket No. 10992120-4

Please find attached the following Appeal Brief for the above-referenced matter.

Best regards,


Petar Kraguljac

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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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|---|---|----------------------|
| In re application of: |) | Examiner: L. Nguyen |
| Beck et al. |) | |
| Serial No.: 10/705,301 |) | Art Unit: 2853 |
| Filed: November 10, 2003 |) | |
| For: Integrated Control Of Power Delivery |) | |
| For Firing Resistors For Printhead |) | |
| Assembly (As Amended) |) | |
| Date of Final Office Action: |) | Attorney Docket No.: |
| August 15, 2005 |) | 10992120-4 |
| |) | |
| |) | |

February 10, 2006

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Alexandria, VA 22313-1450

APPEAL BRIEF UNDER 37 C.F.R. §41.37

Dear Sir:

This Appeal Brief is timely provided one month from the mailing date of the Panel Decision from Pre-Appeal Brief Review dated Jan. 11, 2006.

CERTIFICATE OF FACSIMILE

Date of Deposit: February 10, 2006

I hereby certify that these papers are being transmitted to The Patent and Trademark Office facsimile number (571) 273-8300 on February 10, 2006.

Doreen Melchior
Doreen Melchior

02/13/2006 FMEK11 00000011 082025 10705301

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1. Real Party in Interest:

The real party in interest is Hewlett-Packard Development Company, LP, a limited partnership established under the laws of the State of Texas and having a principal place of business at 20555 S.H. 249 Houston, TX 77070, USA.

2. Related Appeals and Interferences

A Pre-Appeal Brief Request for Review was filed on November 15, 2005. A Panel Decision was issued Jan. 11, 2006 that indicated that the application should proceed to the Board of Patent Appeals and Interferences. The present Appeal Brief is being timely filed within one month of the Panel Decision.

There are no other prior and/or pending appeals, interferences, or judicial proceedings that are related to, directly affect, or that will be directly affected by or have a bearing on the Board's decision.

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3. Status of Claims

Claims 1-14 and 23-29 are pending in the application.

The rejections of claims 1-8, 11-14, and 23-29 are appealed.

Claims 1, 3, 6-8, 13, 23, 26, 28-29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bohorquez (U.S. 5,357,081) in view of Suzuki (U.S. 4,514,737).

Claims 2, 4, 5, 11-12, 24-25, 27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bohorquez (U.S. 5,357,081) in view of Suzuki (U.S. 4,514,737), as applied to claims 1, 23, and further in view of Doluca (US 6,208,127).

Claim 14 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Bohorquez (U.S. 5,357,081) in view of Suzuki (U.S. 4,514,737), as applied to claim 13, and further in view and further in view of Otsuki (US 6,145,961).

Claims 9-10 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 15-22 were canceled.

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4. Status of Amendments

No amendments were filed subsequent to the Final Office Action.

5. Summary of Claimed Subject Matter

Independent Claim 1

Independent claim 1 will be summarized using Figure 6 as a guide. It should be appreciated that Figures 5 and 7 also show various configurations. With reference to Figure 6, Claim 1 concerns a print head 240 having an internal power supply path 292 that supplies power V_{pp} (see specification, page 14, lines 24-30). A power regulator 200 provides an offset voltage 214 from the internal power supply path 292. The offset voltage 214 is inputted to multiple primitives 250a, 250b, ... 250n. An example of a primitive 250 is shown in figure 7 where a group of firing resistors 248a-248n are shown with a corresponding group of switches 223a/224a-224n. An example operation of the switches is described starting at page 16, line 28 to page 17, line 11 of the present specification.

The offset voltage 214 represents an offset used to compensate for off-printhead die parasitic resistances that cause the V_{pp} power supply voltage to sag at the input to the print 240 (specification, page 15, lines 18-21). Since the firing resistors 248 are powered from the V_{pp} power voltage and the offset voltage 214, the firing resistors 248 can have a more constant voltage across it equal to the difference of the V_{pp} voltage and the offset voltage even when the V_{pp} voltage sags (specification, page 17, lines 15-21). Thus, the amount of power delivered to the firing resistors can be kept at a substantially constant level, which can yield a longer print head life (page 17, lines 25-29).

Independent Claim 13

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Claim 13 is directed to a print head assembly that comprises at least one print head. The print head includes elements that correspond to claim 1 and thus the same summary applies.

Independent Claim 23

Claim 23 concerns a method for operating a printhead that recites elements based on the print head of claim 1. Thus, the summary of claim 1 applies to described claim 23.

Independent Claim 28

Claim 28 is directed to a fluid ejection device comprising an internal power supply, a power regulator, nozzles, firing resistors, and a corresponding group of switches that are defined as in claim 1. Thus, the same summary applies for these elements.

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6. Grounds of Rejection to be Reviewed on Appeal

The following grounds of rejection are to be reviewed on appeal:

1. Claims 1, 3, 6-8, 13, 23, 26, 28-29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bohorquez (U.S. 5,357,081) in view of Suzuki (U.S. 4,514,737). Applicant respectfully appeals this rejection.

2. Claims 2, 4, 5, 11-12, 24-25, 27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bohorquez (U.S. 5,357,081) in view of Suzuki (U.S. 4,514,737), as applied to claims 1, 23, and further in view of Doluca (US 6,208,127). Applicant respectfully appeals this rejection.

3. Claim 14 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Bohorquez (U.S. 5,357,081) in view of Suzuki (U.S. 4,514,737), as applied to claim 13, and further in view and further in view of Otsuki (US 6,145,961). Applicant respectfully appeals this rejection.

Additionally, MPEP §2141.03 requires that Office Actions ascertain and describe the level of the hypothetical person of ordinary skill in the art so that objectivity can be maintained. Here the Office Actions neither ascertained nor reported on the level of ordinary skill in the art. This reduced Applicant's ability to produce a meaningful response to the rejections, making the rejections improper. Thus, all the rejections are appealed.

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7. Argument

I. 35 U.S.C. §103(a) Rejection of Claims 1, 3, 6-8, 13, 23, 26, 28-29

Claims 1, 3, 6-8, 13, 23, 26, 28-29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Bohorquez (U.S. 5,357,081) in view of Suzuki (U.S. 4,514,737).

To establish a prima facie case of 35 U.S.C. §103 obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. MPEP §2143.01 Second, there must be a reasonable expectation of success. MPEP §2143.02 Third, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP §2143.03 Additionally, the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. In re Vaack, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). This requirement is intended to prevent unacceptable "hindsight reconstruction" where Applicant's invention is recreated from references using the Application as a blueprint.

Here, the first and third criteria described in MPEP §2143.01 and §2143.03 are not satisfied since (1) there is no suggestion or motivation to modify or combine the reference(s), and (2) the combination of references does not teach or suggest all the claim limitations. None of the references, alone and/or in combination, teach a print head (claim 1), a print head assembly (claim 13), or a fluid ejection device (claim 28) with the claimed power regulator and group of switches. Thus, none of the claims are obvious for at least this reason.

The Applicant asserts that the combination of Bohorquez in view of Suzuki does not teach or suggest each and every claimed element and/or limitation and thus the 35 U.S.C. §103(a) rejections should be withdrawn. Additionally, the Office Actions provide no teaching, motivation, or suggestion to combine the references and thus the 35 U.S.C. §103(a) rejections should be withdrawn for this additional reason. Furthermore, the level of skill of one "skilled in

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the art" has not been ascertained. Therefore, even if a motivation to combine existed, it could not be properly responded to because of the missing skill level determination.

The MPEP requires that the Office Action ascertain and describe the level of ordinary skill so that objectivity can be maintained. MPEP §2141.03 reads:

The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry. *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718, 21 USPQ2d 1053, 1057 (Fed. Cir. 1991). The examiner must ascertain what would have been obvious to one of ordinary skill in the art at the time the invention was made, and not to the inventor, a judge, a layman, those skilled in remote arts, or to geniuses in the art at hand. *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 218 USPQ 865 (Fed. Cir. 1983), *cert. denied*, 464 U.S. 1043 (1984).

Here the Office Action neither ascertains nor reports on the level of ordinary skill in the art. For this additional reason all the obviousness rejections are improper and should be withdrawn.

The Claims Patentably Distinguish Over The References Of Record

Claim 1 is used as an exemplary claim since independent claims 13 and 28 recite similar limitations but in other forms. Independent method claim 23 recites limitations that will also be shown to be patentable based on the discussion of claim 1. The errors in the present rejections are discussed as follows.

The Final Office Action (middle of page 2) states that Bohorquez teaches a power regulator that provides an offset voltage and cites "Fig. 3: the voltage at the positive input of element 16". Applicant respectfully submits that the explanation of Figure 3 in Bohorquez says nothing about an offset voltage being provided by the power control 20. The only discussion of Figure 3 by Bohorquez is in column 4, lines 7-21, which state:

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"FIG. 3 is a simplified schematic diagram of conventional circuits for controlling the energy applied to the heater resistor of thermal inkjet printheads. R_p represents the parasitic resistance in the trace and R_R represents the resistance in the return lead.

As mentioned above, the components required by conventional systems to control the voltage applied to the heater resistor of thermal inkjet printheads are costly to manufacture, consume space on the circuit board, consume power and lowers the reliability of the system. Accordingly, it is an object of the present invention to provide a simple, low cost, reliable system for controlling the power applied to the heater resistor of a thermal inkjet printhead which consumes little power."

The disclosure discusses controlling the voltage applied to the heater resistor but says nothing about using an offset voltage. Indeed, controlling voltage can be performed in many different ways without using an offset voltage. Thus, Bohorquez does not teach or suggest that the signal at positive input of element 16 in Figure 3 is an offset voltage as implied by the Examiner. The term "offset" does not even appear in the Bohorquez patent. It is only speculation to assume that an offset voltage is provided from the power control 20. More likely, hindsight is being used to find features in the reference that are not disclosed. In either case, Bohorquez fails to support the rejection and the rejection cannot stand without an actual teaching or suggestion.

Therefore, the teaching of the claimed feature of a power regulator providing an offset voltage is not supported by an actual teaching or suggestion of Bohorquez. Therefore, Bohorquez does not support the rejection and the rejection must be withdrawn.

Since the recited power regulator is not taught or suggested, then the recited multiple primitives and the recited group of switches and their recited couplings between the internal power supply path and the offset voltage are also not taught or suggested by the references (see claims 1, 13, 28, and method claim 23 with the recited "coupling"). For this additional reason, Bohorquez does not support the present rejection.

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Bohorquez Shortcoming – Changing claim limitations - another ground of error

In the Final Office Action, the 103 rejection is based on a combination of Bohorquez and Suzuki due to a shortcoming of Bohorquez. The second paragraph of page 3 in the Final Office Action describes the Bohorquez shortcoming as:

“Bohorquez does not disclose wherein the power regulator provides the offset voltage *from the internal power supply path voltage*. In other words, Bohorquez does not disclose wherein the power regulator directly connects to the internal power supply path.” (emphasis in original).

The Examiner attempts to curc this shortcoming by applying the teachings of Suzuki, which is discussed in detail below. However before that discussion, Applicant respectfully submits that the Examiner’s interpretation, which leads to the basis of rejection, is flawed and improper. In particular, the Examiner changes the recited limitations of the claims to a different, non-recited limitation: “In other words, Bohorquez does not disclose wherein the power regulator directly connects to the internal power supply path.” None of the present claims recite “a power regulator directly connected to the internal power supply path”.

More importantly, the Examiner’s interpretation still fails to teach or suggest the claim language of providing an offset voltage. If a power regulator were directly connected to a power supply path that had voltage Vcc as the Examiner states, then the only teaching that results is that the entire voltage Vcc would be provided, not an offset voltage of Vcc. Thus, this interpretation fails to support the Examiner’s conclusion that an offset voltage would be provided, and the rejection is baseless.

This interpretation appears to be another attempt to support an improper rejection with references that do not teach or suggest the actual claimed features. For this additional reason, the rejection is not supported by the references and must be withdrawn.

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Suzuki Reference – U.S. Patent Number 4,514,737

The Final Office Action uses Suzuki to teach a power regulator for providing an offset voltage from the internal power supply path voltage. (See Final Office Action, middle of page 3). The Final Office Action then cites "FIG. 9-10: the voltage at the input of the op-amp 31."

Applicant respectfully points to co-pending application Serial Number 10/712,112 which cites the same combination of Bohorquez and Suzuki, cited by the present Examiner. In the Office Action issued August 17, 2005, the Examiner stated that Suzuki did not teach a voltage at the input of the op-amp 31, but rather a drive pulse signal p. (see Office Action attached as Evidence Exhibit, page 5, line 18, which states, "...Suzuki does not teach providing an offset voltage..."). Thus, the Examiner is now contradicting his previous position since Suzuki clearly teaches a drive pulse signal p and not an offset voltage as claimed. Conflicting interpretations of Suzuki can not be maintained.

Continuing with the rejection in the Final Office Action on page 7, it states that Suzuki and Bohorquez both concern the same way to control driving by taking a sample voltage to feedback to a controller in order to adjust the driving. However, Applicant respectfully submits that the driving taught by Suzuki is performed with a different function and in a different way than Bohorquez, which produces a different result. Thus, the references do not have the same drive control. For Example, Suzuki in Figure 9 connects the voltage Vcc to a level shift circuit 29, which outputs to the microcontroller 30, which in turn produces a drive pulse signal "p", not an offset voltage. Column 6, lines 42-50 state:

"In the third embodiment, as shown in FIG. 9, a variation in the power source voltage Vcc is detected through a microcomputer (e.g., the microprocessor 8022 manufactured by INTEL Corporation) 30. The power source voltage Vcc is supplied to a microcomputer 30 through a level shift circuit 29, The output signal (a pulse signal) of the microcomputer 30 is supplied to a driving circuit 14 after being amplified by an operational amplifier 31." (emphasis added)

Suzuki, column 6, lines 59-63, state:

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"Microcontroller 30 produces a drive pulse signal p...whose rise time is delayed with reference to the timing signal d3 for the interval mentioned."

It is clear that microcomputer 30 outputs a pulse signal "p" that is the input to operational amplifier 31 (see Figure 9 and 11b). The input is not an offset voltage. Thus, the Examiner's conclusion that the input to the operational amplifier 31 is an offset voltage is incorrect (Final Office Action, page 3, line 14: "FIG. 9-10: The voltage at the input of the op-amp 31"). Therefore, the Examiner's interpretation of Suzuki is incorrect and thus, the basis for making the combination of Suzuki and Bohorquez is flawed and does not support a proper obviousness rejection. Suzuki and Bohorquez fail to teach the present claims and the rejection must be withdrawn.

Accordingly, when the teachings of the references are appropriately understood as by one of ordinary skill in the art, it is understood that the operation and configuration of Suzuki is much different than the operation of Bohorquez. This leads to another point of error in the rejections, which relates to the Examiner's inappropriate interpretation and changing of claim limitations.

Changing Claim Limitations

In particular as explained above, the Examiner improperly changes the claim language of "a power regulator providing an offset voltage from the internal power supply path voltage" to "a power regulator directly connected to the internal power supply path." The Examiner has ignored the actual claim language and instead uses a different meaning in order to apply Suzuki. With the different meaning of "a direct connection", the Examiner simply shows that Suzuki teaches a direct connection of the Vcc to the level shift circuit 29 (Figure 9), then implies the actual claim limitations, and concludes that it would be obvious to make this modification to Bohorquez (Final Office Action, page 3, paragraph. 4). This reasoning is improper and fails to support an obvious rejection because the required teaching or suggestion of the claim limitations are not found.

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As explained previously, directly connecting the voltage V_{cc} to the level shift circuit 29 would provide the voltage V_{cc} , not an offset voltage of V_{cc} . There is simply no teaching or suggestion to the contrary. Therefore, the rejection is not supported by the references for this additional reason and the rejection cannot stand.

Furthermore, Suzuki cannot be used to teach that the voltage V_{cc} can be inputted to a controller and then ignore the rest of the circuit. One of ordinary skill in the art would not understand Suzuki in this manner. There is a reason for the specific connections of Suzuki that reflect its specific configuration and functionality. Applying Suzuki's teachings to Bohorquez, simply connecting an internal power supply voltage to the power control 20 of Bohorquez does not automatically re-configure the circuit with non-existent functionality that makes it provide an offset voltage as presently claimed. The Office Action attempts to teach the features of claim 1 in a piece-meal fashion without sufficient teachings, which is improper, but even the piece-meal combination still fails to teach the specifically claimed configuration of claim 1.

Suzuki uses the power supply to provide the driving pulse signal p , not an offset voltage (see Figure 9). Bohorquez's Figure 3 is vague as to what is being output from power control 20, but it is not based on voltage from the power supply. Thus, both references fail to teach or suggest a power regulator providing an offset voltage from the internal power supply as recited in claim 1.

Therefore, the resulting combination of Bohorquez and Suzuki still fails to teach or suggest the all elements of claim 1 including the claimed power regulator and the group of switches in combination with the other claimed elements. Accordingly, the similar limitations in independent claims 13 and 28 are also not taught or suggested. For similar reasons, the method of claim 23 is not taught or suggested including providing an offset voltage from the internal power supply path voltage and the claimed coupling.

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Thus, independent claims 1, 13, 23, and 28 patentably and unobviously distinguish over the references of record and the rejections should be overturned.

Bohorquez and Suzuki have different functions and operate in different ways

The Office Action on page 3, line 6 states, "In other words, Bohorquez does not disclose wherein the power regulator directly connects to the internal power supply path." As stated previously, Applicant respectfully submits that this is not what is recited in the claim and is an attempt to trivialize the claim language to a simple direct connection of the power regulator to an internal power supply path in order to make Bohorquez appear more relevant. Such a interpretation ignores the claimed functionality that the offset voltage is provided from the internal power supply path voltage. Of course, all claimed elements must be shown by the references, and in the present case, they are not shown as further explained in the following paragraphs.

Applicant respectfully submits that the "driving" taught by Suzuki is performed with a different function and in a different way than Bohorquez, which produces a different result. Therefore, one of ordinary skill in the art would not find it obvious to simply swap connections between the references. Thus, the references do not teach or suggest all the claimed features.

For example, Figure 3 of Bohorquez shows a circuit for "controlling the energy applied to the heater resistor of thermal inkjet printheads" and "controls the voltage applied to the heater resistor." (see column 4, lines 7-15). Suzuki, conversely, does not control the voltage but has the object to "stabilize the printing timing and printing pressure of a printing head" when there is a variation in the power source voltage (Summary, column 2, lines 15-20). Thus, Suzuki is directed to a printing timing and printing pressure stabilizing circuit. In fact, the Summary of the Invention states that the invention will "obviate the necessity of providing a circuit for stabilizing the power source voltage." (Suzuki, Summary, column 2, lines 45-46). This appears contrary to the circuit of Bohorquez.

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Therefore, one of ordinary skill in the art would understand that the Suzuki invention has a very different purpose and function and provides no suggestion to modify a voltage controlling circuit like Figure 3 from Bohorquez. The same rationale applies to Bohorquez in that no suggestion exists to modify the voltage controlling circuit of Figure 3 in Bohorquez with the timing and pressure stabilizing circuit of Suzuki. Simply connecting the power control 20 of Bohorquez to an internal power supply path voltage is not enough to teach all the claimed elements and such a connection is not taught or suggested by Suzuki.

For these additional reasons, the references fail to teach or suggest the claimed features and thus fail to support a proper prima facie rejection for obviousness.

II. 35 U.S.C. § 103(a) Rejection of Claims 2, 4, 5, 11-12, 24-25, 27

Dependent Claims 2, 4, 5, 11-12, 24-25, 27 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bohorquez (U.S. 5,357,081) in view of Suzuki (U.S. 4,514,737), and further in view of Doluca (US 6,208,127). As explained previously, Bohorquez and Suzuki fail to teach or suggest the present independent claims. Thus, dependent claims 2, 4, 5, 11-12, 24-25, 27 and also not taught or suggested and patentably distinguish over the references of record.

III. 35 U.S.C. § 103(a) Rejection of Claim 14

Claim 14 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Bohorquez (U.S. 5,357,081) in view of Suzuki (U.S. 4,514,737), as applied to claim 13, and further in view and further in view of Otsuki (US 6,145,961).

Claim 14 is dependent on independent claim 13, which has been shown to patentably distinguish over Bohorquez and Suzuki. Therefore, Otsuki fails to cure the fundamental shortcomings of the Bohorquez and Suzuki, and the rejection is not supported by the references.

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Dependent claim 14, thus, is also not taught or suggested and patentably distinguishes over the references of record.

IV. Advisory Action – Improper Definition of Claim Terms

Notwithstanding the numerous reasons for overturning the rejections as explained above, Applicant addresses one other error that is additional grounds for overturning the rejections.

The Advisory Action (issued November 2, 2005) states that Applicant's request for reconsideration (filed October 17, 2005) does not place the application in condition for allowance. The Advisory discloses that the rejections are based on a definition of claim terms "created" by the Examiner, which is a clear error in the rejections.

Applicant notes that this "definition" was first disclosed to the Applicant in the Advisory Action (e.g. at the absolute end of prosecution before Appeal). Applicant does not believe it is Patent Office protocol for an Examiner to withhold material interpretations that form the basis of the rejections until the end of prosecution, thus, not allowing the Applicant a chance to respond. This form of examination clearly does not "advance prosecution" of the application.

Looking to the Advisory Action, the primary reason applied for the rejection was founded on a dictionary definition of the term "offset". The Advisory Action states that:

"As based on the definition that "offset" is "something that serves to counterbalance or to compensate for something else..." (citing Merriam-Webster's Collegiate Dictionary, Tenth Edition, page 805)

The Examiner then went further and elaborated the dictionary definition even further to create a definition of "offset voltage" as:

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"any electrical signal, either discrete or continuous, digital or analog, unipolar or bipolar, that has a voltage value and being used as an input to adjust "something" in order to compensate for "something else" is considered as "an offset voltage." (Adv. Action)

This elaborated definition goes beyond the dictionary definition and no source or reference was cited as to its origin. The elaborated definition was then the basis for concluding that the cited references of Bohorquez and Suzuki teach the present claims based on an inherency argument (see Advisory Action, page 2, line 7: "...Fig. 3, inherently has a voltage value..."). However, the inherency argument fails to explain how the references actually teach the claimed power regulator and how it provides the offset voltage or how the claimed multiple primitives and group of switches are controlled by the offset voltage (see present claims 1, 13, 28). In sum, no actual teaching or suggestion of the claimed limitations are shown to support the rejection. The inherency rejection is thus only a conclusory statement with no supporting facts needed to support a prima facie rejection, yet has many omissions of fact.

Applicant respectfully submits that the dictionary definition and the elaborated definition were not taken in light of the present specification nor made in the context of the present claims or specification and forms an improper rejection. The Federal Circuit in Phillips v. AWH Corporation, 415 F.3d 1303, 75 U.S.P.Q.2D (Fed. Cir. 2005) has clearly stated that reliance on a dictionary in this manner is improper. In Phillips, the Federal Circuit stated:

Properly viewed, the "ordinary meaning" of a claim term is its meaning to the ordinary artisan after reading the entire patent. Yet heavy reliance on the dictionary divorced from the intrinsic evidence risks transforming the meaning of the claim term to the artisan into the meaning of the term in the abstract, out of its particular context, which is the specification. The patent system is based on the proposition that claims cover only the invented subject matter. *Id.* at 1321.

Applicant respectfully submits that the definition of the term "offset voltage" created by the Examiner is divorced from the intrinsic evidence and is thus improper under Phillips. It seems that the scope and definition of the claim terms have been manipulated in order to improperly cure omissions in the cited teachings and to justify finding inherent teachings where

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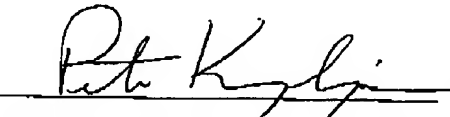
no actual teachings exist. Thus, the rejections are based on a flawed analysis that does not comply with the requirements of 35 U.S.C. §102, §103, or the Federal Circuit. Therefore, all rejections must be overturned.

Conclusion

Applicant respectfully believes that all pending claims 1-14 and 23-29 patentably and unobviously distinguish over the references of record and that the rejection of the claims should be withdrawn. Applicant respectfully requests that the Board of Appeals overturn the Examiner's rejections and allow all pending claims.

Respectfully submitted,

FEB 10, 2006
Date


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Claims Appendix

1. A printhead comprising:
 - an internal power supply path;
 - a power regulator providing an offset voltage from the internal power supply path voltage; and
 - multiple primitives, each primitive including:
 - a group of nozzles;
 - a corresponding group of firing resistors; and
 - a corresponding group of switches controllable to couple a selected firing resistor of the group of firing resistors between the internal power supply path and the offset voltage to thereby permit electrical current to pass through the selected firing resistor to cause a corresponding selected nozzle to fire.
2. The printhead of claim 1 wherein the power regulator is a linear power regulator.
3. The printhead of claim 1 wherein each switch includes a field effect transistor (FET).
4. The printhead of claim 1 wherein the power regulator includes: a digital-to-analog converter (DAC) coupled to the internal power supply path and configured to receive a digital offset command representing a desired offset voltage and to provide an analog offset voltage from the internal power supply path voltage.
5. The printhead of claim 1 wherein the power regulator further includes: a buffer amplifier configured to receive an analog offset voltage and to provide a buffered offset voltage.

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6. The printhead of claim 1 wherein the power regulator further includes:
multiple amplifiers corresponding to the multiple primitives, each amplifier receiving an input offset voltage and providing the offset voltage to a corresponding primitive.
7. The printhead of claim 6 wherein the printhead further comprises:
an internal power ground;
wherein each amplifier includes a first input coupled to the input offset voltage, a second input coupled to the offset voltage, and an output; and
wherein the power regulator further includes:
multiple transistors, each transistor coupled between the internal power ground and the offset voltage and having a gate coupled to the output of a corresponding amplifier.
8. The printhead of claim 7 wherein each transistor is a field effect transistor (FET).
9. The printhead of claim 6 wherein the printhead further comprises:
an internal power ground; and
wherein each amplifier includes a first input coupled to the input offset voltage, a second input coupled to a feedback line, and an output coupled to a drive line;
wherein each firing resistor in a primitive includes a first terminal coupled to the internal power supply path and a second terminal;
wherein the group of switches in each primitive include subgroups of switches, each subgroup of switches corresponding to a firing resistor and including:
a power transistor coupled between the second terminal of the firing resistor and the internal power ground and having a control gate;
a first switch coupled between the drive line and the control gate of the power transistor;
and
a second switch coupled between the feedback line and the second terminal of the firing resistor.

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10. The printhead of claim 9 wherein the power transistor is a field effect transistor (FET).
11. The printhead of claim 4 wherein the DAC is a current-mode DAC.
12. The printhead of claim 4 further comprising: a processor supplying the digital offset command.
13. A printhead assembly comprising:
at least one printhead, each printhead including:
 - an internal power supply path;
 - a power regulator providing an offset voltage from the internal power supply path voltage; and
 - multiple primitives, each primitive including:
 - a group of nozzles;
 - a corresponding group of firing resistors; and
 - a corresponding group of switches controllable to couple a selected firing resistor of the group of firing resistors between the internal power supply path and the offset voltage to thereby permit electrical current to pass through the selected firing resistor to cause a corresponding selected nozzle to fire.
14. The printhead assembly of claim 13 wherein the at least one printhead includes multiple printheads.
- 15.- 22. (Cancelled)

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23. A method of operating a printhead comprising:
- providing an internal power supply path;
 - providing an offset voltage from the internal power supply path voltage; and
 - coupling a selected firing resistor of a group of firing resistors between the internal power supply path and the offset voltage to cause electrical current to pass through the selected firing resistor to cause a corresponding selected nozzle to fire.
24. The method of claim 23 wherein providing the offset voltage includes: converting a digital offset command representing a desired offset voltage to an analog offset voltage from the internal power supply path voltage.
25. The method of claim 24 wherein providing the offset voltage further includes:
- buffering the analog offset voltage.
26. The method of claim 23 wherein providing the offset voltage includes:
- receiving an input offset voltage at a feedback amplifier; and
 - providing the offset voltage with the feedback amplifier.
27. The method of claim 24 further comprising:
- supplying the digital offset command.
28. A fluid ejection device comprising:
- an internal power supply path;

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a power regulator providing an offset voltage from the internal power supply path voltage;

a group of nozzles;

a corresponding group of firing resistors; and

a corresponding group of switches controllable to couple a selected firing resistor of the group of firing resistors between the internal power supply path and the offset voltage to thereby permit electrical current to pass through the selected firing resistor to cause a corresponding selected nozzle to fire.

29. The fluid ejection device of claim 28 wherein the group of nozzles, the corresponding group of firing resistors, and the corresponding group of switches are contained in a first primitive, and the fluid ejection device comprises a second primitive including a second group of nozzles, a second group of firing resistors, and a second group of switches controllable to couple a selected firing resistor of the second primitive between the internal power supply path and the offset voltage to thereby permit electrical current to pass through the selected firing resistor of the second primitive to cause a corresponding selected nozzle of the second primitive to fire.

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Evidence Appendix

Attached is a copy of an Office Action dated August 17, 2005 from co-pending application Serial Number 10/712,112 which cites the same combination of Bohorquez and Suzuki, cited by the present Examiner (L. Nguyen).

Related Proceedings Appendix

There are no related proceedings.


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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|--------------|----------------------|---------------------|------------------|
| 10/712,112 ✓ | 11/13/2003 ✓ | George H. Corrigan | 10010484-2 ✓ | 7670 ✓ |

7590 08/17/2005

 HEWLETT-PACKARD COMPANY
 Intellectual Property Administration
 P.O. Box 272400
 Fort Collins, CO 80527-2400

EXAMINER

NGUYEN, LAM S

ART UNIT

PAPER NUMBER

2853

DATE MAILED: 08/17/2005

 US ACTION _____
 DUE DATE _____
 Paper Dated _____
 OA _____ Final _____ ✓
 Msg. Pt. _____ Dwgs _____
 Appeal _____ Issue Fee _____
 Other _____

Please find below and/or attached an Office communication concerning this application or proceeding.

 EXHIBIT FOR APPEAL BRIEF
 SERIAL NO. 10/705,301

| | | | | |
|------------------------------|------------------------|--|---------------------|--|
| Office Action Summary | Application No. | | Applicant(s) | |
| | 10/712,112 | | CORRIGAN, GEORGE H. | |
| | Examiner | | Art Unit | |
| | LAM S. NGUYEN | | 2853 | |

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address -

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 27 July 2005.

2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 4 and 6 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☒ Claim(s) 4 is/are allowed.

6) ☒ Claim(s) 6 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on 13 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

| | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date _____ 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 6) <input type="checkbox"/> Other: _____ |
|--|---|

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DETAILED ACTION***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bohorquez (US 5357081) in view of Suzuki (US 4514737) and Doluca (US 6208127).

Bohorquez discloses a fluid ejection device comprising:

- an internal power supply path (*FIG. 3: The power line with the resistor Rp*);
- a power regulator or a power delivery control loop (*FIG. 3, element 20*) providing an offset voltage (*FIG. 3: The voltage at the positive input of element 16*) from a feedback voltage;
- a group of nozzles (*column 1, lines 25-35*);
- a corresponding group of firing resistors (*FIG. 3, element R_H and column 1, lines 25-35*);
- a corresponding group of switches (*FIG. 3, element 18*) controllable to couple a selected firing resistor (*FIG. 3, element R_H*) of the group of firing resistors between the internal power supply path and the offset voltage to thereby permit electrical current to pass through the selected firing resistor (*FIG. 3 and column 1, lines 25-35*),
- wherein the power regulator further includes a feedback amplifier (*FIG. 3, element 16*) having a first input (*FIG. 3: The positive input of element 16*) coupled to the offset voltage (*FIG.*

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3: The voltage outputted from the power controller 20) and a second input (FIG. 3: The negative input of element 16) coupled to the feedback, wherein the drive line (FIG. 3: The output of element 16),

wherein a selected switch corresponding to a selected firing resistor has a control gate controlled by the drive line (FIG. 3: The gate of element 18);

wherein the selected firing resistor of the group of firing resistors includes a first terminal and a second terminal coupled to the feedback line, wherein the drive line provides the offset voltage to the feedback line and the second terminal of the selected firing resistor through the selected switch (FIG. 13: The offset voltage outputted from element 16 is provided to the feedback line and the resistor R_H through the switch 18);

wherein the selected switch is coupled between the internal power ground and the second terminal of the selected firing resistor (Fig. 3, 6: The switch 16 or Q1 is coupled the second terminal of heater R_H through resistor R_1 to ground R_R).

Bohorquez does not disclose wherein the power regulator provides the offset voltage from the internal power supply path voltage. In other words, Bohorquez does not disclose wherein the power regulator directly connects to the internal power supply path.

Suzuki discloses a printing head driving apparatus for driving printing elements such as a coil in an impact printer (FIG. 9-10, element 14b) or a heating resistor in a thermal printer (FIG. 13, element 41 and column 7, lines 25-31). The apparatus has an internal power supply path (FIG. 9-10, element V_{cc}), a ground path, a switch 14a located between the ground path and a terminal of the heating resistor or the coil, and a power regulator (FIG. 9-10, elements 29-30 or 32-33) directly connecting to the internal power supply path V_{cc} for sensing the variation of the

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power supply to provide a signal for controlling the driving of printing elements in accordance to variations in the power source voltage (*FIG. 9-10: The voltage at the input of the op-amp 31*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the power regulator disclosed by Bohorquez such as the power regulator provides the offset voltage from the internal power supply path voltage or directly connects to the internal power supply path as disclosed by Suzuki. The motivation of doing so is to drive the printing elements in accordance to variations in the power source voltage in order to gain printing quality as taught by Suzuki (*column 2, lines 36-45*).

- In addition, Bohorquez does not disclose a self-calibration circuit adapted to determine a regulation band of the power regulator defined by a lower set point offset voltage and an upper set point offset voltage.

Doluca discloses a power regulator that includes a self-calibration circuit adapted to determine a regulation band of the power regulator defined by a lower set point offset voltage and an upper set point offset voltage (*FIG. 3, elements 310, 300, and 320*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the power regulator in the printing system disclosed by Bohorquez such as including a self-calibration circuit adapted to determine a regulation band of the power regulator defined by a lower set point offset voltage and an upper set point offset voltage as disclosed by Doluca. The motivation of doing so is to obtain "programmable voltage regulators that are used to provide output voltages that can be set to provide the output voltage required" as taught by Doluca (*column 1, line 25-28*).

Allowable Subject Matter

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2. Claim 4 is allowed and the reason for allowance is indicated in the previous office action.

Response to Arguments

Applicant's arguments filed 07/27/2005 have been fully considered but they are not persuasive.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, one of ordinary skill in the art would motivate to take a voltage sample directly from the internal power supply Vcc as disclosed by Suzuki (FIG. 9-10) rather than at a voltage divided by the firing resistor R_H and the resistor R₁ as taught by Bohorquez (FIG. 3) to feed it back to the controller for controlling the driving so that the driving is in accordance to variations in the power source voltage in order to gain printing quality. Even though, Suzuki and Bohorquez are different in the way to drive printing elements, both concern the same way to control driving by taking a sample voltage to feedback to a controller in order to adjust the driving. Moreover, even though Suzuki does not teach providing an offset voltage, Suzuki suggests using the power supply as voltage sample to control the driving, this cures the shortcoming of Bohorquez. Finally, even though the applicants asserted that Doluca fails to teach the self-calibration circuit, the applicants did not provide any evidence to support for the assertion. As a result, the argument is not persuasive.

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Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **LAM S NGUYEN** whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **STEPHEN D MEIER** can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR


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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN
August 3, 2005


HAI PHAM
PRIMARY EXAMINER